FEED AND FOOD ANALYSIS: AN SCI/FD SCI 5170

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Objectives: To provide graduate students in Animal Science, Food Science and Nutrition with practical and "hands-on" exposure to various methods and procedures used in the analysis of feed and foods. Laboratory calculations and modern instrumentation will be the primary focus.

Expectations: Students will be expected to attend each lecture and laboratory, and at times to remain later than scheduled to accomplish the goals of the particular laboratory exercise. Returning at off times may be necessary, but not frequently.

Notebooks: **Notebooks, for example, the "Comp Book", will be required** for all laboratory exercise data collection, calculations, and laboratory write-ups. Any "chart-recorded" data should be attached to notebook pages where appropriate. Any notes taken during the course of an experiment must be written in the notebook, and not, for example, on a paper towel to be transcribed later. Write-ups for each laboratory will be handwritten; therefore, write-ups must be legible. Write-ups will be graded based on completeness, as well as on correctness of the written document, i.e., grammar and sentence structure will be examined. Lab write-ups will be in the following format: objective; methods; results; discussion.

Problem sets: Periodically, written problems of relevance will be given as homework to provide students an opportunity to practice applying learned mathematical concepts to solving laboratory challenges.

Grades: 100-90 = A; 80-90 = B; 70-79 = C; 60-69 = D; < 60 = F.

References: Food Analysis, second edition, S. S. Nielsen.
               Food Analysis, third edition, Pomeranz and Meloan

Order of Course Topics

Topic
Introduction and orientation. Discussion of literature searching.
Discussion of lab notebooks. Sampling and sample preparation.
Lecture on pH and buffers.
Lab on pH and buffers.
Lecture on proximate analysis. Discussion on moisture, ash, and fat.
Moisture, ash, and fat analysis.
Discussion of results.
Introduction to fiber.
Fiber analysis lab.
Discuss fiber analysis results. Introduction to protein analysis.
LECO N analyses.
Discuss N analysis. Exam review.
Midterm Exam .
Spectrophotometry.
Total protein assays – Biuret and Lowry assays.
Discussion of results.
Finish spectrophotometer labs.
Lipid extraction and thin layer chromatography (TLC). Prepare samples.
Lipid extraction and TLC analysis.
Gas-liquid chromatography (GLC).
Sample prep. and GLC analysis: fatty acid profiles and concentration.
Discussion of GLC data.
High-pressure liquid chromatography (HPLC).
HPLC lab.
Electrophoresis.
Electrophoresis lab.
Atomic absorption (AA) spectroscopy.
AA lab.
Final exam.